

(12) **United States Patent**  
**Kothandaraman et al.**

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(54) **MULT-MODE CONTROLS FOR ENGINES SYSTEMS INCLUDING SCR AFTERTREATMENT**

(58) **Field of Classification Search**  
USPC ..... 60/274, 276, 285, 286, 297, 301;  
701/103, 106, 109, 115  
See application file for complete search history.

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(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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(57) **ABSTRACT**

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An electronic control system is adapted to control a system including an internal combustion engine and an exhaust aftertreatment system including an SCR catalyst. The electronic control system provides a first dynamically determined weighting factor in response to performing a selected one of a plurality of calculations, determines an operating mode of the engine in response to an engine load and an engine speed, selects one of a plurality of inputs in response to the operating mode of the engine to provide an interpolation weighting factor, the plurality of inputs including the first dynamically determined weighting factor and one or more predetermined weighting factors, utilizes the interpolation weighting factor to interpolate between a first set of combustion control data and a second set of combustion control data to determine a set of combustion control values, and controls operation of the engine using the set of combustion control values.

(51) **Int. Cl.**

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**F02D 41/26** (2006.01)  
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(52) **U.S. Cl.**

CPC ..... **F02D 41/0235** (2013.01); **F01N 3/2066** (2013.01); **F01N 11/00** (2013.01); **F02D 41/26** (2013.01); **F01N 2900/1602** (2013.01); **F02D 2200/101** (2013.01)

**20 Claims, 11 Drawing Sheets**

